Lowbush Blueberry Production and Marketing

in NOVA SCOTIA

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Prepared by

JACK D. SIBLEY, HORTICULTURIST

Horticulture and Biology Services

Nova Scotia Department of Agriculture and Marketing

Truro, Nova Scotia

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INTRODUCTION

The lowbush blueberry has developed from humble beginnings into one of the most important horticultural crops in Nova Scotia. The large scale commercial development of today had its beginnings in the late forties and early fifties. Since then, the industry has steadily expanded. Lowbush blueberries are the No. 1 Fruit Crop in the province in terms of total acreage and export sales. and closely rival apples in terms of total value at the farm gate level.

In 1953, provincial production was 1,125,000 pounds with a farm value of $152,000. In 1984, provincial production was 15,107,326 pounds with a farm value of about $4,500,000 and a total value to the province's economy of over 8 million dollars.

PRODUCTION METHODS

Growing a commercial crop of lowbush blueberries has developed into a fairly complex operation. A grower with any significant acreage is involved with various production activities from early spring until late fall. While this booklet is not intended as a production manual, a brief description of the seasonal activities of the blueberry grower is presented here to give a capsule picture of the production methods used with this crop.

PRUNING

Pruning lowbush blueberries is done by flail mowing in the fall or by burning in either the fall or early spring. Pruning gets rid of old growth and promotes the growth of vigorous new shoots which will produce a high yielding crop the following year. Usually, one-half of the total acreage is pruned each year. The blueberry plant produces only vegetative shoots the first season following pruning. The second year, blossoms and fruit are produced. Oil or gas burning machines are used to burn most fields. A few growers spread hay or straw in the fall and burn fields in the spring without the use of a machine.

INSECT AND DISEASE CONTROL

At various times during both the sprout (first) and crop (second) years of growth, sprays or dusts must be applied to control insect and disease pests. These materials are applied either by aircraft or ground dusting or spraying equipment.

WEED CONTROL

Because of the semi-cultivated condition of blueberry fields, weed control is a continuous problem. The weed control program for most fields involves an overall pre-emergent spray in the spring of the sprout year followed by spot spraying to control escape weeds. Some spot treating of weeds may also be done following harvest during the crop year. Bush type weeds are cut and treated with herbicides while softer weeds are sprayed with back sprayers or tractor propelled boom sprayers.

POLLINATION

Lowbush blueberry flowers must be insect pollinated. In order to ensure an adequate pollinating force, many growers place colonies of honeybees in their fields during the bloom period (three weeks during June). The hives of bees are usually removed once the bloom period is over.

HARVESTING

Harvesting on crop fields begins in mid August. This operation involves organizing one or more picking crews to rake the berries which are then delivered to a collecting station or processing plant. Fields are divided into picking lanes with one raker assigned to each lane. Field supervisors, truckers, field weighers, stringers, etc., must be hired for large operations. If only a small acreage is involved, the grower may perform most of these duties himself. Harvesting usually lasts from one to four or five weeks depending on weather conditions and the acreage to be harvested.

In 1984, the first commercially successful mechanical harvesters were used on about 20 farms. It is expected the use of these machines will increase in years to come.

OTHER

Besides these essential operations, many growers are involved in clearing new land for production, improvement of existing fields through fertilizing, drainage, constructing firebreaks, etc.

There are over 1,000 producers in the province. Acreage per grower varies from as low as one acre to well over a thousand acres by some large producers. Thus, annual production per grower can vary anywhere from a low of a few hundred pounds to a high of 1,500,000 pounds or more. Most growers operate their fields on a two year pruning cycle. They try to have about half of their total acreage in crop each year.

About 15 percent of the growers produce less than 25,000 pounds of blueberries annually. About 90 percent produce less than 50,000 pounds annually. Although only about 10 percent produce over 50,000 pounds annually, the total

production of this group usually accounts for over 50 percent of the total annual provincial production.

PRODUCTION AREAS

For the purpose of presenting a more accurate picture of lowbush blueberry production in Nova Scotia, the province may be divided into five production areas:

1) Cumberland County

2) Central Nova Scotia - includes counties of Halifax, Colchester and Hants

3) Western Nova Scotia - includes counties of Kings, Lunenburg, Queens, Annapolis, Shelburne, Yarmouth and Digby

4) Eastern Nova Scotia Mainland - includes counties of Guysborough, Pictou and Antigonish

5) The Island of Cape Breton

Each production area has specific conditions or factors that have a bearing on blueberry production, yields and losses.

About 75 percent of our present production comes from Cumberland County. Although there is still undeveloped acreage which could be brought into production in this county, increased production here will result mainly from improved cultural practices. Yields are generally higher than other areas of the province. This is because development of large acreages took place first in this county, and many fields have been continually improved by a good cultural program over a long period of time. Also, the central part of this county has almost ideal soil and climatic conditions for good blueberry production.

The central region has developed steadily during the past several years. This area has good climatic conditions and a good natural acreage base. Production from this region should continue to increase as more fields are developed and existing acreage is gradually improved.

A fairly rapid increase in the development and improvement of acreage in eastern Nova Scotia is expected during the next several years, particularly in Pictou, Antigonish and Guysborough counties. Fields in this area have very few weed problems and climatic factors appear favorable for development. Production potential on the large tracts of barren land in the southern and coastal areas of Guysborough County is not great because of climatic factors (i.e. short growing season, severe winterkill) and extremely rough terrain. Only a few of these fields are burned on a regular basis, and usually this is the only cultural practice followed. These fields are rough and rocky and, in most cases, they are owned by the province (Crown lands). With no private ownership and severe production constraints, there is lack of individual initiative to develop fields for higher production.

In the western part of the province (from Hants Co. westward), there are around 1,000 acres presently in production and many more potential acres which could be developed. This area has the natural advantage of a longer growing season. However, fields have historically been plagued with more weed problems than in other areas of the province. With the introduction of new and improved methods of weed control, there is a growing interest in developing new acreage in Queens, Lunenburg and Yarmouth counties.

Cape Breton Island has never produced satisfactory commercial yields. For years, this was attributed mainly to lack of sufficient heat units during the growing season in coastal areas where commercial development has been attempted. Several inland locations on the island are currently being developed for commercial blueberry production. It now appears that some of these areas have good potential, and that lack of a proper cultural and management programme may have been the limiting factor in past attempts of commercial development.

PRODUCTION FIGURES

The following table gives annual lowbush blueberry production figures in Nova Scotia for the past twenty-eight years.

YEAR	PRODUCTION	YEAR	PRODUCTION
1956	4,020,000	1961	5,700,000
1957	4,800,000	1962	7,400,000
1958	3,000,000	1963	7,000,000
1959	5,200,000	1964	5,100,000
1960	5,400,000	1965	7,000,000

cont'd...

YEAR	PRODUCTION	YEAR	PRODUCTION
1966	7,600,000	1975	9,928,632
1967	11,500,000	1976	6,842,349
1968	2,100,000	1977	8,202,370
1969	8,882,000	1978	11,618,207
1970	8,200,000	1979	10,723,011
1971	7,100,000	1980	8,348,407
1972	9,897,000	1981	12,866,140
1973	10,075,000	1982	14,113,780
1974	7,557,000	1983	19,502,395
		1984	15,107,326

The overall steady increase in production has been due to a strong production base of privately owned land; continuous research, and promotion of improved cultural practices by government; ample modern processing facilities, and steadily expanding markets.

Years of unusually high production have been mainly due to a particularly favorable growing season with a good supply of moisture. The one year of exceptionally low production (1968) was due to a very late spring frost combined with a prolonged summer drought.

PRODUCTION AND HARVESTING COSTS

The cost of producing and harvesting a pound of blueberries varies greatly from one grower to another depending on the program he follows and the yield per acre he obtains from his fields. As the yield per acre increases, the unit cost decreases accordingly. Most growers feel their cost for production and harvesting is somewhere between 30 and 35 cents per pound.

The table given on the following page outlines costs for a complete production program. By using these figures, one can obtain estimates of the cost of producing and harvesting a pound of blueberries and make a comparison of cost versus different yields obtained. These figures are considered by extension workers to be realistic even though costs do vary considerably among different growers.

PRODUCTION COST PER ACRE

Pruning (Burning)	$ 80.00*
Insect Control	15.00
Disease Control	40.00
Weed Control	55.00
Pollination	20.00
Fertilization	20.00
Taxes, Machinery, Misc.	25.00
	$255.00

HARVESTING AND HANDLING COSTS

Harvesting & Supervision	14¢ to 18¢ / pound
Equipment & Transportation	2¢ / pound
	16¢ to 20¢ / pound

* Cost per acre of pruning by mowing is $30.00 to $50.00.

Production costs vary considerably from grower to grower, depending on the condition of his fields, his location and his management program. The harvesting and handling cost per pound also varies with labor availability, yield per acre, and field conditions. Growers with low yielding or poorly managed fields must pay higher harvesting costs than those with weed free, high yielding fields.

The following table is based on the figures given above and shows some probable production and harvesting costs per pound for various yields per acre. Harvesting and handling costs have been varied from 20¢ to 16¢ to reflect the influence of good yields in lowering harvesting rates.

YIELD	PRODUCTION COST	HARVESTING AND HANDLING COSTS	TOTAL COST
1,000 lbs/acre	25.5 ¢/lb ($255 per acre)	20 ¢/lb	45.5 ¢/lb
1,250 lbs/acre	20.4 ¢/lb ($255 per acre)	19 ¢/lb	39.4 ¢/lb
1,500 lbs/acre	17.0 ¢/lb ($255 per acre)	18 ¢/lb	35.0 ¢/lb
1,750 lbs/acre	14.5 ¢/lb ($255 per acre)	17 ¢/lb	31.5 ¢/lb
2,000 lbs/acre	12.7 ¢/lb ($255 per acre)	16 ¢/lb	28.7 ¢/lb
2,250 lbs/acre	11.3 ¢/lb ($255 per acre)	16 ¢/lb	27.3 ¢/lb
2,500 lbs/acre	10.2 ¢/lb ($255 per acre)	16 ¢/lb	26.2 ¢/lb
2,750 lbs/acre	9.2 ¢/lb ($255 per acre)	16 ¢/lb	25.2 ¢/lb
3,000 lbs/acre	8.5 ¢/lb ($255 per acre)	16 ¢/lb	24.5 ¢/lb

If a grower is following a complete production program and has a yield of only 1,000 pounds per acre, he would need about forty-six cents per pound to cover

his costs. If his yield was 3,000 pounds per acre, he would need about twenty-five cents to cover his costs.

Because of the great variations between growers' costs, it is difficult to determine meaningful average production costs for growing lowbush blueberries. Each operation must be assessed on the basis of its production, location, yield, management plan, and the variable cost factors mentioned on the preceding page.

The form below could be used by all growers in order to determine their own production and harvesting costs.

PRODUCTION COST PER ACRE

Pruning	$
Weed Control	$
Disease Control	$
Insect Control	$
Pollination	$
Fertilization	$
Taxes	$
Machinery & Equipment	$
Miscellaneous	$_____
TOTAL	$_____ Per Acre

HARVESTING COST (Cents per Pound)

Picking	_____ cents
Supervision	_____ cents
Supplies & Equipment	_____ cents
Transportation	_____ cents
	_____
TOTAL	_____ cents per Pound

The production cost per pound is calculated by dividing the yield per acre into the production cost per acre. By adding this cost to the harvesting cost, the total production and harvesting cost per pound is obtained. This can then be compared to the market price for berries to determine profit or loss per pound of berries produced (see form next page).

TOTAL PRODUCTION AND HARVESTING COST PER POUND

Production Cost Per Pound _____ Cents
Harvesting Cost Per Pound _____ Cents

Total Cost of Production and Harvesting Per Pound _____ Cents

PROFIT OR LOSS

Market Value of Blueberries _____ Cents per Pound
Cost of Production & Harvesting _____ Cents per Pound

Profit or Loss _____ Cents per Pound

The use of such records will result in greater efficiency and better managment.

THE MARKETING SYSTEM

Practically all of Nova Scotia's annual lowbush blueberry crop is frozen for eventual use in manufactured blueberry products. The marketing system which has evolved for this crop involves several steps or marketing procedures.

Before going into a discussion on marketing, there are several terms which should be defined.

1) A *grower* is a person who grows and harvests blueberries. He may or may not be a *buyer* or *processor*.

2) A *buyer* is a person who buys blueberries from the *grower* and sells to the *processor*. He is usually, but not necessarily, a *grower* himself.

3) A *processor* is a person who buys blueberries from the *buyer* or directly from the *grower*. He processes (freezes) these berries at his plant. They are then either resold immediately or stored and held for future sales. Some *processors* are also large *growers*.

4) A *manufacturer* is a person who buys blueberries (mostly frozen but sometimes fresh) for use in the manufacturing of blueberry pies, tarts, muffins, etc., or other manufactured products.

The *buyer*, or middleman as he is sometimes called, is an important link in the marketing chain and has done a lot to develop the blueberry industry in Nova Scotia. He has helped to create a ready market for many small growers and has also provided them with a great many necessary custom services. There are approximately 20 *buyers* in the province of Nova Scotia at present (1985). Most of these *buyers* are also large *growers*.

Most *buyers* supply the necessary harvesting and marketing equipment, such as rakes, pails and field cleaners, to *growers*. Sometimes, they provide picking crews (paid for by *growers*) to harvest the crop. Boxes for harvesting and transporting the berries are provided by the *processor*. Most *buyers* and *processors* own burners and will custom-burn fields. Many *buyers* and *processors*

also provide services such as weed control work, spraying and fertilizing, hives for pollination, etc. on a custom basis. All this, of course, means that each grower does not have to invest a lot of money in supplies and equipment.

Most *buyers* have collecting points or receiving stations set up where they receive the blueberries. At these stations, the berries are weighed, cleaned and then shipped to a processing plant. All of the Nova Scotia production does not go through *buyers*. A considerable amount is grown by, or sold directly to, the *processor*, and some blueberries are sold fresh on the retail consumer market.

In 1984, about 69 percent of Nova Scotia's production was shipped to Nova Scotia *processors*, and about 31 percent was shipped fresh to processing plants outside Nova Scotia (mostly in the state of Maine).

Up until 1972, approximately 70 percent of the total Nova Scotia processed pack was usually sold to United States manufacturers, while the other 30 percent was sold to manufacturers in Canada. Beginning in 1972, increasing amounts of Nova Scotia berries were sold to European countries such as West Germany, Sweden, Norway and the Netherlands. From 1977 to 1982, over 60 percent of each year's crop was sold in Europe. Small quantities were sold in Japan in the late 1970's and this market has been increasing steadily since then. In most cases, shipments to these overseas markets are made by refrigerated containers through the port of Halifax. Shipments to European markets declined substantially in 1983 and 1984 because of the strength of the Canadian dollar in relation to most European currencies.

PRICES PAID TO GROWERS

Prices paid to the grower over the last twenty-eight years are given as follows:

YEAR	AVERAGE PRICE (¢/lb)	YEAR	AVERAGE PRICE (¢/lb)
1956	10.5¢	1962	8.5¢
1957	12 ¢	1963	12 ¢
1958	12.5¢	1964	15 ¢
1959	10.5¢	1965	24 ¢
1960	10 ¢	1966	16 ¢
1961	9 ¢	1967	7 ¢

cont'd...

YEAR	AVERAGE PRICE (¢/lb)	YEAR	AVERAGE PRICE (¢/lb)
1968	17 ¢	1976	32 ¢
1969	15 ¢	1977	62 ¢
1970	21 ¢	1978	50 ¢
1971	16 ¢	1979	38 ¢
1972	24 ¢	1980	45 ¢
1973	28 ¢	1981	48 ¢
1974	18.5¢	1982	60 ¢
1975	26.5¢	1983	40 ¢
		1984	30 ¢ *

Prices over this period have fluctuated greatly from a low in 1967 of 7 cents to a high in 1977 of 62 cents. (* Estimated -- final figure not available at time of printing)

The average price per pound received by growers in the 1950's was 11.8 cents; in the 1960's, this rose to 13.4 cents per pound. During the 1970's, the grower price averaged 31.6 cents per pound; and over the past five years, the average grower price has been 44.6 cents per pound.

Since the mid 1970's, a steadily increasing market demand has been stimulated in Europe and Japan through promotional efforts by Nova Scotia's growers and processors, and promotion both in North America and overseas markets by the North American Blueberry Council and the Wild Blueberry Association of North America. New markets in European countries and Japan lessened Nova Scotia's dependence on the U.S. market, and have resulted in good prices to growers since the mid 1970's. The lower price in 1984 resulted from inventory build-up from two successive high production years in 1982 and 1983. There is a continuing job to be done in selling blueberries in new market areas as production continues to increase.

PROCESSING

There are two processing companies in Nova Scotia which freeze blueberries for resale to the manufacturer:

1) Cobi Foods Ltd.	Berwick, Kings County, Nova Scotia
2) Oxford Frozen Foods Limited	Oxford, Cumberland County, Nova Scotia and Halfway River, Cumberland County, Nova Scotia

Both companies have Individual Quick Freezing (I.Q.F.) facilities in their

plants and have access to adequate storage facilities to handle the amount of berries they process.

PROCESSING COSTS

An explanation of costs involved in processing and marketing lowbush blueberries is given below. Various costing systems are used by different processors but it is generally agreed that total processing costs, excluding transporation, duty and brokerage charges, will run between 35 and 40 cents per pound. Transportation costs vary with product destination. Duty and brokerage charges are a percent of the selling price, and vary with it. Total processing and marketing costs in 1984 ranged from 40 to 45 cents per pound depending on the variable costs noted above.

To illustrate the relationship of processing and marketing costs to finished product, consider the following example. If a processor pays 45 cents per pound for blueberries delivered to his plant, and his total processing and marketing costs based on the cost figures given on the preceding page, are 45 cents; then that processor must receive at least 90 cents per pound for the finished, frozen product. This would simply cover costs and allow for no margin of profit. A brief explanation of some of the processing and marketing costs is presented below to give an indication of various items which make up the total cost picture.

SHRINKAGE

This item refers to the loss in weight due to dirt, small berries and other foreign material which is removed as the berries go through the cleaning and processing lines. The amount of shrinkage is variable but will usually run somewhere between 10 and 12 percent.

DIRECT COSTS

. Labour (for handling and inspecting the product as it moves from field or collecting station through the processing line and into cold storage).

. Short Term Interest . Containers and Supplies . Taxes, Dues, Etc.
. Electricity . Storage

OVERHEAD

This item includes all equipment and facilities, maintenance and repairs, insurance, company administration, interest on financing, depreciation, etc.

MARKETING COSTS

DUTY AND BROKERAGE CHARGES

These are a necessary part of the marketing process. They are calculated as a percentage of the selling price and vary with it. Duty does not apply to berries sold on the Canadian or U.S. market, but berries shipped to overseas markets may be subject to import duties as set up by the importing country.

TRANSPORTATION CHARGES

These charges vary with the destination of the product but will generally run between four and six cents per pound for U.S. destinations and about ten to fifteen cents per pound for European destinations.

FRESH MARKETS

Each year, some blueberries are sold by growers on the local fresh market either in pints or quarts to the stores or roadside fruit stands; or in larger containers for home freezers. There are so many people selling a few pounds this way that it is very difficult to get an accurate picture of the total involved. There are five to six commercial operations marketing fresh fruit. The total volume of fruit marketed in this manner in 1984 was about 340,000 pounds.

Selling berries on the fresh market requires more labour and special materials and equipment to do a proper job. There is, however, a good opportunity for development of substantial sales if a producer is willing to expend some time and effort to set up an efficient operation, put out a high quality product, and promote this product through the wholesale and retail trade outlets.

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